CLAIMS

1. A composition for detecting a target microorganism in a sample, comprising a conditionally detectable marker, wherein said marker is capable of providing a detectable signal when in contact with a viable microorganism, and a substrate for an enzyme that is substantially absent from the target microorganism.

2. The composition of claim 1, wherein said target microorganism is selected from the group consisting of bacteria, yeast, mold, fungi, protozoa, and viruses.

3. The composition of claim 2, wherein said target microorganism is bacteria.

4. The composition of claim 3, wherein said bacteria is selected from the group consisting of *salmonella*, *listeria*, *E.coli OH157*, *Campylobacter*, *Staphylococcus aerus*, *cryptsporidium*, and *giardia*.

5. The composition of claim 4, wherein said bacteria is *Campylobacter*.

6. The composition of claim 1, wherein said conditionally detectable marker is detectable by a change in color.

7. The composition of claim 6, wherein said change in color is produced by the biochemical reduction of tetrazolium red.

8. The composition of claim 1, wherein said substrate comprises a signal moiety linked to the substrate, the signal moiety capable of providing a detectable signal when cleaved by substantially all non-target microorganisms.

9. The composition of claim 1, wherein said enzyme is an aminopeptidase.

10. The composition of claim 9, wherein said enzyme is an L-alanine-aminopeptidase.

11. The composition of claim 10, wherein said substrate is selected from the group consisting of L-Alanine-7-amido-4-methylcoumarin, L-Alanine-7-amido-4-methylcoumarin TFA, L-Alanine-7-amido-4-trifluoro-methylcoumarin TFA, L-Alanyl-L-alanyl-L-phenylalanine-7-amido-4-methylcoumarin, and L-Alanyl-L-alanyl-L-phenylalanine-7-amido-4-methylcoumarin TFA.

12. The composition of claim 11, wherein said substrate is L-alanine-7-amido-4-methylcoumarin.

13. The composition of claim 6, wherein said non-target microorganisms include substantially all non-*Campylobacter* species.

14. The composition of claim 1, further comprising a growth-supporting medium for the target microorganism.

15. The composition of claim 14, wherein said growth supporting medium contains all necessary nutrients and growth conditions to properly support the growth of the target microorganism.

16. The composition of claim 14, wherein said growth supporting medium contains antibiotics to suppress the growth of non-target microorganisms.

17. A medium for detecting viable microorganisms in a sample comprising:

a.) a substrate for an aminopeptidase;

b.) a conditionally detectable marker, wherein said marker is capable of providing a detectable signal when in contact with a viable microorganism;

c.) a signal moiety linked to the substrate, said moiety providing a detectable signal when cleaved by said aminopeptidase from a microorganisms; and

d.) a growth supporting medium for target or non-target microorganisms.

18. The medium of claim 17, wherein the aminopeptidase is L-alanine aminopeptidase.

19. The medium of claim 17, wherein said signal moiety is ortho-nitrophenyl, 4-methylumbelliferone, para-nitroanilide, 4-methoxy-.beta.-naphthylamide, 7-amido-4-methylcoumarin.

20. The medium of claim 17, wherein said enzyme substrate is: N-o-Acetyl-lysine-7-amido-4-methylcoumarin acetate; N-Acetyl-L-phenylalanyl-L-arginine-7-amido-4-methylcoumarin hydrochloride; L-Alanine-7-amido-4-methylcoumarin; .beta.-Alanine-7-amido-4-methylcoumarin TFA; D-Alanine-7-amido-4-methylcoumarin TFA; L-Alanine-7-amido-4-methylcoumarin TFA; L-Alanine-7-amido-4-methylcoumarin TFA; L-Alanine-7-amido-4-trifluoro-methylcoumarin TFA; L-Alanyl-L-alanyl-L-phenylalanine-7-amido-4-methylcoumarin; L-Alanyl-L-alanyl-L-phenylalanine-7-amido-4-methylcoumarin TFA; D-Alanyl-L-leucyl-L-lysine-7-amido-4-methylcoumarin Salt; L-Arginine-7-amido-4-methylcoumarin hydrochloride; L-Arginyl-L-arginine-7-amido-4-methylcoumarin trihydrochloride; L-Asparagine-7-amido-4-methylcoumarin TFA; L-Aspartic acid-b-(7-amido-4-methylcoumarin); N-.alpha.-Benzoyl-DL-arginine-7-amido-4-methylcoumarin; N-.alpha.-Benzoyl-L-arginine-7-amido-4-methylcoumarin; N-Benzoyl-L-phenylalanyl-L-valyl-L-arginine-7-amido-4-methylcoumarin; S-Benzyl-L-cysteine-7-amido-4-methylcoumarin; N-BOC-L-phenylalanyl-L-seryl-L-arginine-7-amido-4-methylcoumarin acetate; N-BOC-L-vanyl-glycyl-L-arginine-7-amido-4-methylcoumarin hydrochloride; N-BOC-L-vanyl-L-leucyl-L-lysine-7-amido-4-methylcoumarin Salt; N-.alpha.-CBZ-L-arginine-7-amido-4-methylcoumarin hydrochloride; N-CBZ-glycylglycyl-L-leucine-7-

amido-4-methylcoumarin; N-CBZ-glycyl-L-proline-7-amido-4-methylcoumarin; N-CBZ-glycyl-L-prolyl-L-arginine-7-amido-4-methylcoumarin; N-.beta.-CBZ-L-lysine-7-amido-4-methylcoumarin; N-CBZ-L-phenylalanyl-L-arginine-7-amido-4-methylcoumarin hydrochloride; N-CBZ-L-prolyl-L-arginine-7-amido-4-methylcoumarin hydrochloride; L-Citrulline-7-amido-4-methylcoumarin hydrochloride; L-Citrulline-7-amido-4-methylcoumarin hydrochloride TFA; D-Glutamic acid-.gamma.-(7-amido-4-methylcoumarin); L-Glutamic acid-.alpha.-(7-amido-4-methylcoumarin); L-Glutamine-7-amido-4-methylcoumarin hydrochloride; Glutaryl-glycyl-L-arginine-7-amido-4-methylcoumarin hydrochloride; Glutaryl-glycylglycyl-L-phenylalanine-7-amido-4-methylcoumarin; Glutaryl-L-phenylalanine-7-amido-4-methylcoumarin; Glycine-7-amido-4-methylcoumarin hydrochloride; Glycyl-L-alanine-7-amido-4-methylcoumarin hydrochloride; Glycyl-L-arginine-7-amido-4-methylcoumarin Salt; Glycylglycine-7-amido-4-methylcoumarin hydrochloride; Glycyl-L-phenylalanine-7-amido-4-methylcoumarin; Glycyl-L-proline-7-amido-4-methylcoumarin hydrochloride; L-Histidine-7-amido-4-methylcoumarin; L-Isoleucine-7-amido-4-methylcoumarin; L-Isoleucine-7-amido-4-methylcoumarin TFA; L-Leucine-7-amido-4-methylcoumarin; L-Leucine-7-amido-4-methylcoumarin hydrochloride; L-Leucyl-1-valvyl-1-tyrosine-7-amido-4-methylcoumarin; L-Lysine-7-amido-4-methylcoumarin acetate; L-Methionine-7-amido-4-methylcoumarin acetate; L-Ornithine-7-amido-4-methylcoumarin carbonate; L-Phenylalanine-7-amido-4-methylcoumarin TFA; L-Proline-7-amido-4-methylcoumarin hydrochloride; L-Prolyl-L-phenylalanyl-L-arginine-7-amido-4-methylcoumarin Salt; L-Pyroglutamic acid-7-amido-4-methylcoumarin; L-Serine-7-amido-4-methylcoumarin hydrochloride; L-Seryl-L-tyrosine-7-amido-4-methylcoumarin hydrate; or, L-Tyrosine-7-amido-4-methylcoumarin.

21. The medium of claim 17, wherein the linkage is a peptide bond.

22. The medium of claim 17, wherein said signal moiety is a fluorescent moiety, and said fluorescent moiety is capable of providing a fluorescent signal.

23. The medium of claim 17, wherein said signal moiety is a chromogen moiety, and said chromogen moiety is capable of providing a signal in the visible, ultraviolet or infrared spectrum.

24. A method for detecting viable target microorganisms in a sample, the method comprising:

a.) providing a medium comprising the composition of claim 1;

b.) inoculating the medium with the sample to be tested for the presence of target microorganisms;

c.) incubating the inoculated medium under conditions suitable for the growth of target microorganisms wherein the enzyme substrate is capable of being acted upon by an enzyme from substantially all non-target microorganisms to produce a detectable signal; and

d.) comparing the difference between the signal generated by conditionally detectable marker and the enzyme substrate, whereby the absence or decrease in a detectable signal indicates the presence of target microorganisms in the sample.